



AF JMW

**PATENT APPLICATION**

**RESPONSE UNDER 37 CFR §1.116  
TECHNOLOGY CENTER ART UNIT 2814**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Hiroyuki ABE et al.

Group Art Unit: 2814

Application No.: 08/930,449

Examiner: S. H. Rao

Filed: October 7, 1997

Docket No.: 039514

For: HIGH ENERGY SUPPLY APPARATUS, METHOD OF FORMING CRYSTALLINE  
FILM AND METHOD OF MANUFACTURING THIN FILM ELECTRONIC DEVICE

**REQUEST FOR RECONSIDERATION AFTER FINAL REJECTION**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

In reply to the December 29, 2004 Final Office Action, reconsideration based on the following remarks is respectfully requested. Claims 1, 2, 4-18 and 64-69 are pending in this application.

**I. Remarks Entry after Final Rejection**

Entry of these remarks is proper under 37 CFR §1.116 because the arguments therein:

a) place the application in condition for allowance for all the reasons discussed herein; b) do not raise any new issues requiring further search or consideration; c) place the application in better condition for appeal if necessary; and d) address formal requirements of the Final Rejection and preceding Office Action. Accordingly, Applicants respectfully request entry of this Request for Reconsideration.

**II. The Claims Satisfy the Requirements under 35 U.S.C. §112, second paragraph**

The Final Office Action rejects claims 12-18 and 65-69 under 35 U.S.C. §112, second paragraph, as being indefinite. This rejection is respectfully traversed.

The phrase “above a top of the chamber” is recited in claim 12 in context of a window, which is provided near a chamber side wall. Examples are shown, for example, at page 24, lines 9-16 and Fig. 2 for a window (206) at the top of a projected portion (210) having a distance L1 above a subject material (203). The top of the chamber (201) has a height L2 from the subject material (203) limited by a chamber wall (209) to be less than L1. These reasons apply by extension to claims 13-18 and 65-69 based on their dependence from claim 12. Withdrawal of the rejection under 35 U.S.C. §112, second paragraph is respectfully requested.

### **III. Claims 1, 2, 4-18 and 64-69 Define Patentable Subject Matter**

The Final Office Action rejects claims 1, 2, 4-18 and 64-69 under 35 U.S.C. §103(a) over U.S. Patent 5,329,207 to Cathey *et al.* (hereinafter “Cathey”) in view of U.S. Patent 5,200,630 to Nakamura *et al.* (hereinafter “Nakamura”). This rejection is respectfully traversed.

The Final Office Action admits that Cathey does not describe a portion of the wall of the chamber being projected in a direction orthogonally outward from the substrate, with a window being provided at a top surface of the projected portion of the wall, the chamber extending along at least one direction parallel to the surface of the surface, and the projected portion of the wall being above the top of the chamber. Contrary to assertions in the Final Office Action, Nakamura does not compensate for these deficiencies, as discussed below.

Cathey and Nakamura do not teach or suggest a method of forming a crystalline film, including setting a substrate in a chamber, the substrate having a thin film on a surface of the substrate, a portion of a wall of the chamber being projected in a direction orthogonally outward from the substrate, a window being provided at a top surface of the projected portion of the wall, the chamber extending along at least one direction parallel to the surface of the substrate, the projected portion of the wall being above the top of the chamber, applying energy through the window to a surface layer of the thin film, melting at least the surface

layer of the thin film under a mixed gaseous atmosphere by the applied energy; and crystallizing at least the surface layer of the thin film, as recited in claim 1.

Also, Cathey and Nakamura, alone or in combination, fail to teach or suggest a method of forming a crystalline film, including setting a substrate in a chamber, the substrate having a thin film on a surface of the substrate, a window being provided near a side wall of the chamber, the window being disposed orthogonally outward from the surface of the substrate above a top of the chamber, the chamber extending along at least one direction parallel to the surface of the substrate, applying energy through the window to a surface layer of the thin film with a normal direction of the thin film shifted by an angle from a direction of an irradiation path, melting at least the surface layer of the thin film under a mixed gaseous atmosphere by the applied energy, and crystallizing at least the surface layer of the thin film, as recited in claim 12.

Instead, Cathey discloses a method for producing an electrode baseplate 21. In particular, Cathey teaches a silicon substrate 11 deposited with a conductive material layer 12 with atmospheric pressure support structures 18 between a phosphor coated screen 16 and the baseplate 21 (col. 4, lines 11-30 and Fig. 1 of Cathey).

Moreover, Nakamura discloses a method to produce a semiconductor layer 3 of polycrystalline silicon. In particular, Nakamura teaches a chamber 51 in which a vacuum is drawn and hydrogen gas is introduced through an inlet 60. Nakamura also teaches generating hydrogen plasma between electrodes 55 and 56 (col. 4, lines 33-64 and Fig. 6 of Nakamura).

Nakamura lacks any teaching or suggestion of a window provided near a side wall of the chamber disposed orthogonally outward from the surface of the substrate above a top of the chamber, but instead a window disposed at the same level as the top of the chamber walls. As described in the specification at, for example, page 25, lines 4-10, Applicant's claimed features include the projected portion of the wall being above the top of the chamber, which

provides an advantage reducing melted material from adhering to and thereby obscuring the window through which energy passes to melt the material of the thin film.

Moreover, the alleged motivation to provide an enclosed space for hydrogenating grain boundaries and improve carriers mobility does not suggest projecting the window above the top of the chamber, and one of ordinary skill in the art would not have considered such an objective as teaching Applicants' claimed features. Nakamura does not compensate for these deficiencies in Cathey acknowledged in the Final Office Action. Thus, contrary to the Final Office Action assertions, one of ordinary skill in the art would not have found obvious a window provided near a side wall of the chamber disposed orthogonally outward from the surface of the substrate above a top of the chamber, based on a combination of Cathey and Nakamura.

Consequently, Applicants respectfully submit that neither Cathey nor Nakamura teaches or suggests a chamber for producing a crystalline film on a substrate, the chamber extending parallel to the substrate. Additionally, Applicants respectfully assert that both Cathey and Nakamura fail to teach the chamber as having a window at a top part of the chamber wall that projects orthogonally outward from the substrate.

Further, there would have been no motivation to combine features related to the electrode baseplate of Cathey with the vacuum chamber of Nakamura, nor has the Office Action established sufficient motivation for a *prima facie* case of obviousness. Even assuming that motivation to combine the applied references is established, the combination fails to teach or suggest Applicants' current combination of claimed features.

A *prima facie* case of obviousness for a §103 rejection requires satisfaction of three basic criteria: there must be some suggestion or motivation either in the references or knowledge generally available to modify the references or combine reference teachings, a reasonable expectation of success, and the references must teach or suggest all the claim

limitations (MPEP §706.02(j)). Applicants assert that the Final Office Action fails to satisfy these requirements with Cathey and Nakamura.

For at least these reasons, Applicants respectfully assert that independent claims 1 and 12 are patentable over the applied references. The dependent claims are likewise patentable over the applied references for at least the reasons discussed as well as for the additional features they recite. Consequently, all the claims are in condition for allowance. Thus, Applicants respectfully request that the rejection under 35 U.S.C. §103 be withdrawn.

**IV. Conclusion**

In view of the foregoing amendments and remarks, Applicants respectfully submit that this application is in condition for allowance. Favorable reconsideration and prompt allowance are earnestly solicited.

Should the Examiner believe that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below.

Respectfully submitted,



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Date: February 23, 2005

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